

**4.2 Writing & Solving Equations
& Inequalities in One Variable**

2017-18

Name _____ Date _____ Period _____

1. An open box is made from a rectangular piece of cardboard measuring 12 inches by 16 inches, by cutting identical squares from the corners and turning up the sides. What are the lengths of the sides of the removed squares if the area of the bottom of the open box is 60 in^2 ?
2. The width of a box is 2 inches less than twice the height. The length is 4 inches less than three times the height. The volume is 2240 in^3 . What are the dimensions of the box?

Solve each equation by factoring using substitution when necessary.

3. $(x+3)^2 - 2(x+3) - 24 = 0$

4. $x^{\frac{2}{3}} + 9x^{\frac{1}{3}} + 20 = 0$

$$5. \quad x^3 = 16x$$

$$6. \quad x^5 + 4x^4 = 21x^3$$

$$7. \quad \frac{1}{(x+2)^2} = \frac{1}{x+2} + 2$$

$$8. \quad x^{\frac{4}{3}} - 6x^{\frac{2}{3}} + 9 = 0$$

$$9. \quad x^3 - 3x^2 - 4x + 12 = 0$$

$$10. \quad x - 3x\sqrt{x} = 0$$

$$11. \quad 3(2-x)^2 + 5(2-x) + 2 = 0$$

$$12. \quad \frac{1}{(x+5)^2} - \frac{4}{x+5} = 12$$

Use sign charts to solve each inequality.

13. $x^2 + x - 12 \geq 0$

14. $x^2 + 11x + 28 < 0$

15. $4x^3 - 4x > 0$

16. $(x+1)(x^2 - 3x + 2) < 0$

17. $\frac{x}{x+3} \geq 0$

18. $\frac{x-1}{x^2-4} < 0$

19. $x|x-2| > 0$

20. $(2x-1)\sqrt{x+4} < 0$

Solve each equation for the specified variable.

21. $\frac{l}{T^2} = \frac{g}{4\pi^2}$, solve for T

22. $\frac{r_1}{r_2} = \sqrt{\frac{M_2}{M_1}}$, solve for M_1

23. $\sqrt{b^2 - 4ac} = k$, solve for b

24. $a_n = a_1 + (n-1)d$, solve for n

25. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ solve for c

26. $y = \frac{x+2}{x-6}$, solve for x

Review

Simplify the expressions

27. $\frac{3x^2 - 3}{x + 2} \cdot \frac{x^3 + 8}{x - 1}$

28. $\frac{3x}{x+2} + \frac{5}{x-1}$